Government Resolution on reducing greenhouse gas emissions from maritime and inland waterway transport

MINISTRY OF TRANSPORT AND COMMUNICATIONS

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Abstract

According to the Programme of Prime Minister Sanna Marin's Government, Finland will achieve carbon neutrality by 2035. The targets for reducing emissions from transport must be in line with this goal. According to the Government Programme, a roadmap for fossil-free transport will be drafted, where the concrete emissions reduction measures will be described. This Government Resolution confirms national measures and Government priorities for exerting influence internationally to reduce greenhouse gas emissions from maritime and inland waterway transport.

Keywords IMO, shipping, marine traffic, inland waterway traffic, greenhouse gases, climate change, waterborne traffic, emissions

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Valtioneuvoston periaatepäätös meri- ja sisävesiliikenteen kasvihuonekaasupäästöjen vähentämisestä

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Tiivistelmä

Pääministeri Sanna Marinin hallitusohjelman mukaan Suomi on hiilineutraali vuonna 2035. Liikenteen päästövähennystavoitteiden tulee vastata tähän tavoitteeseen. Hallitusohjelman mukaan tällä hallituskaudella luodaan tiekartta fossiilittomaan liikenteeseen, jossa osoitetaan konkreettiset keinot hallituksen tavoitteisiin pääsemiseksi. Tällä periaatepäätöksellä osoitetaan nämä keinot meri- ja sisävesiliikenteen osalta sekä vahvistetaan valtioneuvoston yhteinen näkemys tavoitteista ja kansainvälisen vaikuttamistyön painopisteistä meri- ja sisävesiliikenteen kasvihuonekaasupäästöjen vähentämiseksi.

Asiasanat	IMO, vesiliikenne, meriliikenne, sisävesiliikenne, merenkulku, kasvihuonekaasut, päästöt, ilmastonsuojelu		
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Statsrådets principbeslut om minskning av växthusgasutsläppen från sjöfart och inlandssjöfart

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Referat

Enligt statsminister Sanna Marins regeringsprogram är Finland koldioxidneutralt år 2035. Målen för minskning av utsläppen från trafiken ska svara på detta mål. Enligt regeringsprogrammet upprättas en färdplan för fossilfri trafik under denna regeringsperiod, där man påvisar konkreta metoder för att uppnå regeringens mål. Avsikten med principbeslutet som nu ges är att påvisa dessa metoder för sjöfartens och inlandssjöfartens del samt att förstärka statsrådets gemensamma uppfattning om målen och prioriteringarna i det internationella påverkansarbetet för att minska växthusgasutsläppen från sjöfart och inlandssjöfart.

Nyckelord	IMO, sjötrafik, havstrafik, insjöfart, sjöfart, växthusgaser, utsläpp, klimatskydd		
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Introduction

Considering its transport performance, shipping is an energy-efficient mode of transport with low emissions. However, the absolute greenhouse gas emissions of international maritime transport, in particular, are considerable, which is why emissions from maritime and inland waterway transport must be reduced further to achieve the targets for reducing transport emissions. The rapid development and deployment of new low-carbon and zero-carbon solutions represent not only challenges but also significant opportunities for the entire Finnish maritime cluster.

Maritime transport is vital for Finland, as approx. 90% of Finnish exports and 80% of imports of goods are carried by sea. A country located a long distance away from the main European markets and across a sea that freezes in winter may incur significant additional costs from reducing shipping emissions. Consequently, the challenge lies in finding an effective balance between measures that reduce emissions from ships on the one hand, and their economic impacts on the industry and economy on the other.

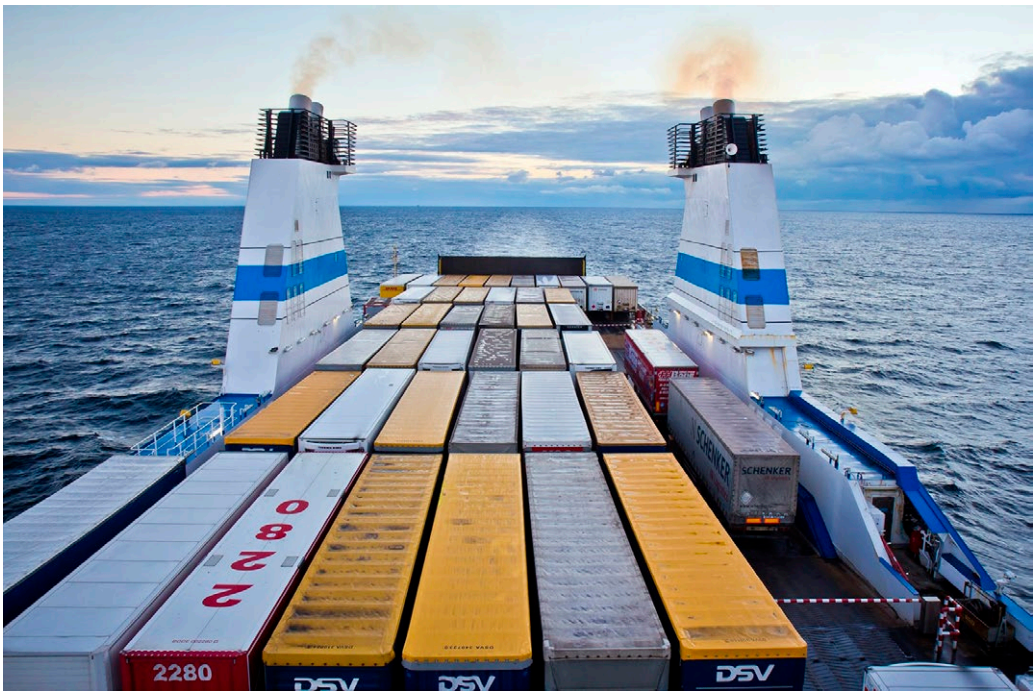
In the context of climate and environmental regulation applicable to maritime transport, the Maritime Transport Strategy for Finland (Ministry of Transport and Communications 9/2014) notes that Finland will primarily seek international regulation through the IMO (*International Maritime Organization*). Government resolutions on Finland's Strategy for the Baltic Sea Region (Prime Minister's Office 15a/2017) and Finland's Maritime Policy Guidelines (Prime Minister's Office 2019:4) stress the pioneering role of maritime logistics and the entire Finnish maritime cluster in reducing emissions. Reducing greenhouse gas emissions from maritime logistics is one of the priorities of Finland's maritime policy, and promoting low-carbon maritime transport is one of its on-going measures.

It should be noted, however, that cutting greenhouse gas emissions is part of a larger scheme for reducing the environmental impacts of maritime transport, which also includes reducing emissions of sulphur and other harmful substances from ships into air and water. This is why the impacts of new regulation exclusively applicable to greenhouse gas emissions on the overall environmental regulation of waterborne transport and its economic consequences should be taken into account in decision-making.

By reducing both traffic and emissions, the coronavirus pandemic has had a dramatic impact on the international shipping sector and, in particular, on passenger ship companies in Finland. The global exceptional situation has created challenges affecting the demand and supply of maritime transport services and continues to threaten the economic viability of transport operations. However, it is believed that maritime transport will recover within a few years, and traffic volumes and emissions are expected to grow further.

This Resolution on reducing emissions from maritime and inland waterway transport addresses the possibilities of both exerting influence at the international level and taking national measures. The drafting of the Resolution was underpinned by the work on the Finnish roadmap for fossil-free transport, in which the methods for reducing emissions from maritime and inland waterway transport and their impacts were assessed extensively for the first time in Finland. The implementation of the roadmap's measures will be monitored regularly as described in Chapter 3.

1 Current status and predicted trends of greenhouse gas emissions from maritime and inland waterway transport



Cargo ship in the Baltic Sea (Alex Marakhovets / Shutterstock)

The CO_2 emissions from Finland's internal maritime and inland waterway transport account for about four per cent of the carbon dioxide emissions from domestic transport. In 2019, the CO_2 emissions from domestic waterborne transport amounted to approx. 0.53 million tonnes (Mt). This figure also includes emissions from fishing vessels. CO_2 emissions account for approx. 98.6% of all greenhouse gas emissions from domestic maritime and inland waterway transport[1], and the volume of greenhouse gas emissions reported with the same level of accuracy were 0.54 million tons of carbon dioxide equivalent (Mt CO_2-eq.) in 2019.

1 MEERI model of LIPASTO system [http://lipasto.vtt.fi/meeri/index.htm]. LIPASTO is a calculation system for traffic exhaust emissions and energy use in Finland, while MEERI is LIPASTO's calculation model for waterborne transport.

The MERIMA model, which describes Finland's international maritime transport, indicates that the total CO_2 emissions from maritime transport of goods between Finland and other countries amounted to 5.67 Mt in 2017. In this calculation model, CO_2 emissions account for 99% of the greenhouse gas emissions.[2]

In the future, emissions from both domestic waterborne transport and maritime transport between Finland and other countries are expected to decrease from their current level, for example due to improvements in the energy efficiency of ships and more stringent environmental regulation. However, estimates of the trends in emission amounts are inaccurate, and such phenomena as the global coronavirus pandemic which began in spring 2020 also affect Finland's maritime transport and thus shipping emissions.

The Fourth IMO Greenhouse Gas Study[3] estimated that total shipping emitted 1,056 million tonnes of CO2 in 2018, or less than 3% of total global emissions for that year. The same study estimates that, based on economic and energy scenarios, emissions from international shipping could represent 90-130% of 2008 emissions by 2050, unless efficient measures are taken to reduce them.

The good news in the latest IMO GHG Study is that the trend in greenhouse gas emissions from international maritime transport has not followed the trend in freight volumes since 2008. In other words, the transport performance and freight volume have continued to increase, whereas CO_2 emissions have actually decreased from their 2008 levels. Between 2012 and 2018, however, greenhouse gas emissions from international maritime transport once again increased by 9.6%.

2 Calculated using the MERIMA model, greenhouse gas emissions from the maritime transport of goods between Finland and other countries totalled 5.73 Mt CO2-eq. in 2017.

3 IMO: Fourth IMO GHG Study 2020 – Final report (document MEPC 75/7/15)

2 Targets and measures for reducing greenhouse gas emissions from maritime and inland waterway transport

Finland is committed to the IMO's objectives of reducing emissions from ships and the EU's emissions reduction targets. Apart from these international targets, Finland has not set any numeric national goals for reducing emissions from maritime and inland waterway transport. Prime Minister Marin's Government Programme notes that Finland will continue to play an active role in the EU-level and international organisations in promoting measures to reduce maritime emissions. In the IMO, Finland has promoted ambitious targets for reducing emissions from international shipping and a tight timeline for the introduction of emissions reduction measures, as the highest impact can be achieved by global measures. In the highly international maritime sector, it is essential that the measures will promote a level playing field and that they will not involve the risk of carbon leakage to regions with less stringent regulation. In addition to global measures, Finland also finds EU actions on reducing shipping emissions necessary.

The Initial IMO Strategy on reduction of GHG emissions from ships was adopted in spring 2018. This Strategy foresees a need to reduce carbon intensity, or CO_2 emissions per transport work, as an average across international shipping by at least 40% by 2030, pursuing efforts towards 70% by 2050, compared to 2008. Additionally, GHG emissions from international shipping should peak as soon as possible and be reduced by at least 50% by 2050 compared to 2008 levels, whilst pursuing efforts towards phasing them out consistently with the Paris Agreement temperature goals.

International maritime transport, which means transport between EU Member States and to destinations in third countries, remains at the EU level the only transport mode not included in the EU's GHG emissions reduction commitment. The Commission has proposed that, as part of the European Climate Law, the EU set the target at reducing greenhouse gas emissions by at least 55% by 2030 compared to 1990 levels. The target of climate neutrality by 2050 contained in the proposal for the European Climate Law covers emissions regulated under EU legislation. While CO_2 emissions from shipping are covered by the EU MRV Regulation on monitoring emissions (*Monitoring, Reporting and Verification*), there is currently no EU regulation on the actual measures for reducing greenhouse gas emissions. The planned EU measures on reducing shipping emissions may have a bearing on whether or not shipping will be included in the EU 's climate objectives.

However, the Commission has announced its intention of proposing that the EU ETS be extended to shipping. In September 2020, the plenary session of the European Parliament supported the extension of the ETS to shipping and voted in favour of imposing on all European shipping companies an obligation to reduce the average annual CO_2 emissions of their ships by at least 40% in proportion to the transport performance by 2030. The key elements of the Commission's legislative initiative concerning emissions trading were not yet known as this Resolution was written. Finland's more detailed positions on the initiative will be formulated separately.

The Commission also intends to issue a legislative proposal on promoting the demand for alternative marine fuels in early 2021. The largest ports are already subject to a conditional obligation under the EU Directive on Alternative Fuels Infrastructure to provide shore-side electricity by the end of 2025. The Commission also intends to propose a revision of this directive, which may have an impact on shipping.

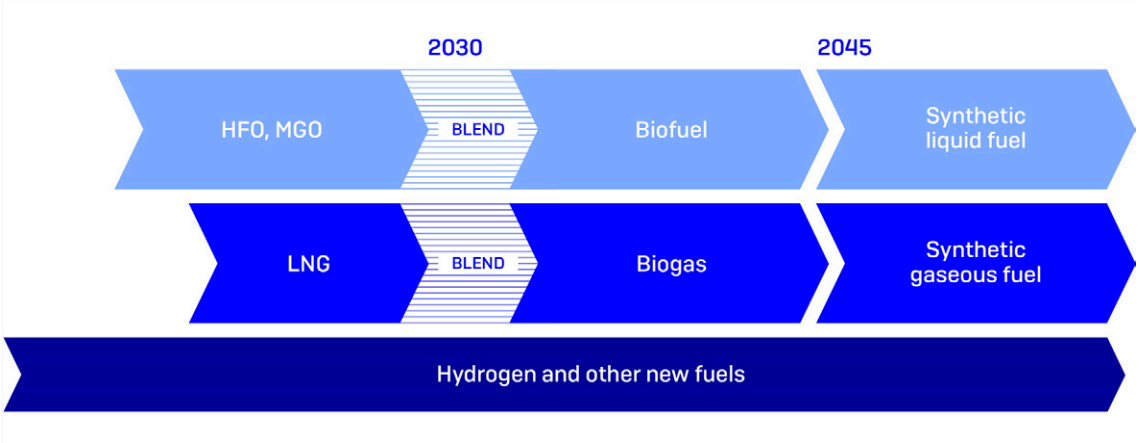
Rather than being achieved by a few simple measures, a number of measures that are interlinked and often progress at different rates in negotiations between intergovernmental organisations will be needed to attain the objective of reducing shipping emissions. Consequently, such factors as the current market trends of alternative marine fuels and the state of play in international negotiations within the IMO and the EU must be taken into consideration in national decisions on emissions reduction measures.

Below in this Resolution, the measures aiming to reduce greenhouse gas emissions from maritime and inland waterway transport have been grouped based on whether they concern the transition to alternative driving powers and fuels (Section 2.1), improving the energy efficiency of existing vessels and developing new low-emission vessels (Section 2.2), management of waterborne transport (Section 2.3) or influencing international decisions on emissions reduction measures (Sections 2.5 and 2.6). Measures relevant to inland waterway transport are included in Section 2.3. Emissions reduction measures for ferry services and boating are set out in a separate section, 2.4.

2.1 Supporting the transition to alternative driving powers and fuels in waterborne transport

Transitioning to low-emission and ultimately zero-emission power sources is the only way to reduce shipping emissions as required by international targets, even after all methods pertaining to the technical and operational performance of ships and the transport system have been exhausted. As the average lifecycle of ships is approximately 25 to 30

Figure 1. Possible pathways to sustainable alternative fuels in shipping



years, extremely rapid deployment of alternative power sources and development of their distribution infrastructure in shipping will be required to achieve the agreed emissions reduction targets.

Maritime and inland waterway transport can use many of the same alternative forms of driving powers and fuels as other modes of transport. From the point of view of waterborne transport, however, the greatest challenges related to alternative fuels currently lie in their prices, which are higher than those charged for conventional fuels, the sufficiency of these fuels for waterborne transport needs, anticipation of distribution needs at port level, and the strict safety requirements arising from the nature of waterborne transport. A number of alternative fuels are currently being investigated and developed for use in maritime transport, but some of them still have a long way to go before they are ready for large-scale commercial use.

Rather than a single driving power or fuel being best suited for all waterborne traffic, different power sources and fuels are needed, depending on the ship type and length of the voyage. This is why multiple options should be developed in parallel. As we cannot sit around waiting for entirely new fuels and their distribution infrastructure to be developed, phasing out the current fossil fuels as soon as possible and a step-by-step transition to zero-emission power sources will be essential. For this, certainty of the direction that the development will take is needed, especially at the international level, as well as a long-term outlook for the palette of energy forms available and under development outside the shipping industry. Without a clear direction and energy sector outlook, operators in the highly competitive maritime sector dare not make investments in alternative power sources and their distribution infrastructures.

While the energy palette of shipping today still is heavily dependent on oil, classification society DNV GL estimates that by 2050, new low-carbon and carbon-free fuels will account for 60%, and natural gas for 30%, of the energy used by this industry.[4] In addition to international regulation, the wider use of alternative fuels in shipping will naturally be influenced by fuel prices and the development of distribution infrastructure. In short-sea shipping in the Baltic Sea, the development of driving powers could rely on replacing both liquid and gaseous fossil fuels with biofuels, in addition to battery technology and shore-side electricity.

The development and rapid uptake of '*drop-in fuels*', which can be blended with the fuels currently in use, will be important to ensure that the maritime sector is not left waiting for the construction of the expensive distribution infrastructure required for new fuels. A rapid transition to entirely new fuels, such as hydrogen, on existing ships would require costly investments in new ship technology solutions. The preconditions for a sustainable transition in the driving powers of shipping are thus likely to include measures that support existing ships' transition to completely carbon-neutral fuels through *drop-in fuels* on the one hand, and the development and deployment of new ships powered by such carbon-free fuels as hydrogen on the other.

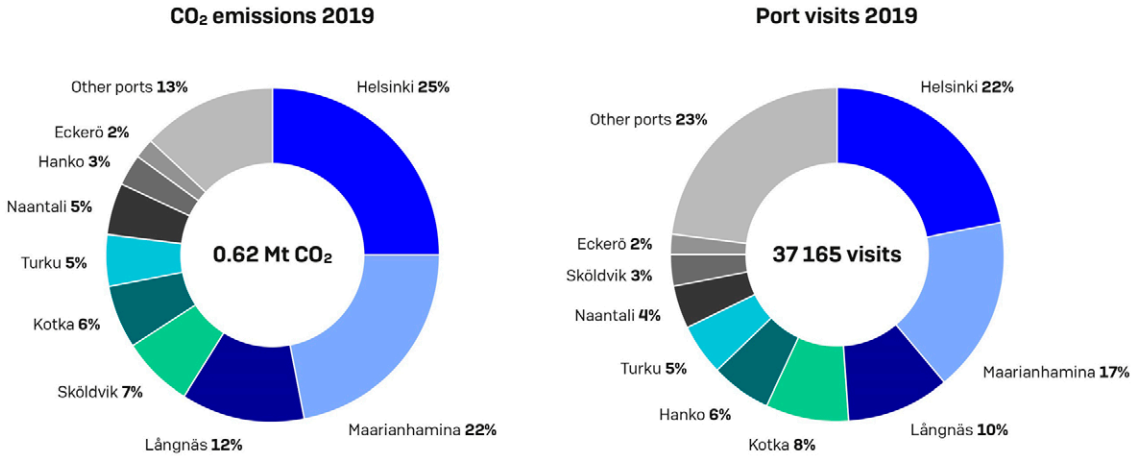
Under the National programme for a distribution network for alternative transport fuels, Finland's target regarding liquefied natural gas and biogas is that all ports in Finland's TEN-T core network should offer the possibility of refuelling ships with liquefied natural gas or biogas by no later than 2025. This target has already been achieved in the main, as tankers and bunkering vessels can transport LNG (*liquefied natural gas*) and biogas to ports in which gas is not directly supplied from the terminal. Under the national Strategy for the Baltic Sea Region, Finland will promote the marketing of biofuels and biogas for transport use in all modes of transport in the Baltic Sea region. Joint production of biofuels, for example with the air transport sector, could support the attainment of this objective.[5]

In line with international and EU Member States' policies, all fuels used by merchant shipping in Finland are exempt from excise duty and the strategic stockpile fee. To facilitate supervision, however, the tax exemption of undyed biofuel oils has been implemented through a refund procedure, unlike for conventional fuels: while tax is levied on these undyed biofuel oils, it is later refunded. This has given rise to a misconception in the industry of all biofuels for merchant shipping not being tax exempt. Other factors related to the tax treatment of biofuels in different countries and modes of transport also have a significant impact on the price of biofuels in Finnish ports.

4 DNV GL (2020): Energy Transition Outlook 2020, Executive Summary, p. 15

5 Finnish Marine Industries, Elomatic (2020): *Ways to decarbonize shipping*

Figure 2. CO_2 emissions from ships while in Finnish ports in 2019



CO_2 emissions from ships while in Finnish ports were 0.62 Mt in 2019. Out of this, 0.55 Mt came from the 10 largest ports. There were altogether 37 165 port visits in Finnish ports in 2019. Out of these, 29 736 were visits in the 10 largest ports.

By using shore-side electricity, ships in port can keep their electrical systems running without using the on-board diesel generators, thus replacing approx. 50% to 80% of ships' fuel consumption at berth. The use of shore-side electricity thus significantly reduces the CO_2 emissions of vessels while in port, provided that the electricity has been produced sustainably. In addition to lower greenhouse gas emissions, the benefits of using shore-side electricity include reduced noise and local emissions.

For shore-side electricity, the target set in the National programme for a distribution network for alternative transport fuels is that the largest Finnish ports would offer facilities for using shore-side electricity no later than 2030. The current EU directive on alternative fuels infrastructure obliges Member States to install shore-side electricity supply as a priority in ports of the TEN-T Core Network, and in other ports, by the end of 2025, unless there is no demand and the costs are disproportionate to the benefits, including environmental benefits.

To encourage the use of shore-side electricity, its tax treatment should be similar to the taxation of electric rail transport; the electricity used by this mode of transport is eligible to full tax exemption. Finland's reference countries around the Baltic Sea, or Sweden, Denmark and Germany, apply the reduced rate enabled by EU regulation in the taxation of shore-side electricity.

More than one half of the CO_2 emissions from vessels in Finnish ports are generated in Helsinki, Mariehamn and Långnäs, which are the three busiest ports measured by port calls. Special attention should consequently be paid to reducing emissions from passenger ferries that frequently call at these ports. Under the National programme for a distribution network for alternative transport fuels, almost zero emissions should be reached in the terminal traffic of all ports by no later than 2050. New machinery and equipment in ports should run on an alternative driving power by no later than 2030. In inland waterway transport, the aim is to cover the gas supply potentially needed by vessels navigating the deep-water channels in Lake Saimaa with a mobile refuelling facility or similar located in Mustola, Lappeenranta, by 2030 at the latest.

Finland's aim is to ensure an adequate and efficient alternative fuel distribution infrastructure in its ports by continuing to implement the National programme for a distribution network for alternative transport fuels. Finland also considers EU actions necessary to increase the supply and demand of alternative marine fuels. At the EU level, the demand and supply of alternative marine fuels are promoted by the Directive on the deployment of alternative fuels infrastructure (2014/94/EU) and by the Commission's *FuelEU Maritime* initiative, for example. The objectives of the initiative include addressing market barriers that hamper the use of alternative fuels and uncertainty about which technical options are market-ready.

Measures:

1) Channelling national research and innovation funding to developing entirely new marine fuels, including methanol, hydrogen, ammonia and synthetic fuels, and the ship technologies required to use them in the Baltic Sea region. Exerting influence for similar allocation in EU financial instruments.

2) Once advanced electrification of road transport has been achieved, channelling the use of renewable fuels not only to air transport but also maritime transport by international decisions.

3) Including undyed biofuel oils within the scope of tax-free supply of marine fuels, thus eliminating the need for a refund procedure to implement the tax exemption of these fuels.

4) Submitting a request for an exemption referred to in Article 19 of the Energy Taxation Directive, which would allow Finland to apply a reduced tax rate to shore-side electricity similarly to Sweden, Denmark and Germany, and once the exemption has been granted, transferring shore-side electricity used for ship operation in commercial ports to the lowest electricity tax category. In

order to develop the supply and demand of shore-side electricity, ports and shipping companies will make full use of CEF calls for proposals.

5) In the EU, exerting influence on the drafting of the FuelEU Maritime initiative and other measures aiming to increase the demand for alternative fuels for merchant shipping, ensuring that they will genuinely reduce emissions and take into account cost-efficiency, competitiveness and the risk of carbon leakage. Assessing the need for national measures once the Union's legislative framework has been clarified.

6) Exerting influence on the revision of the EU directive on alternative fuels infrastructure (2014/94/EU) and assessing the need for national measures. Considering the need for measures in support of distribution infrastructure development not only for shore-side electricity and LNG but also for hydrogen and other fuels referred to in the directive.

Drawing up a report on the electrification of maritime transport and the possibilities of using battery-powered vessels in short-sea shipping in the Baltic Sea as well as on the needs to develop the requisite charging infrastructure in Finnish ports. In this context, assessing the long-term possibilities of using other alternative marine fuels, especially wind propulsion, hydrogen and biofuels, in Finnish merchant shipping.

2.2 Supporting the improvement of existing ships' energy efficiency and the development of new low-emission vessels

In the transition to alternative fuels, it is important that the ship's energy efficiency and operation are optimised to avoid wasting renewable energy on inefficient transport work. So-called fuel flexibility, which refers to a ship's ability to switch between several different fuels and driving powers during its lifecycle directly or with minor retrofitting, is also essential. Fuel flexibility will make it possible for ships built during this decade to reduce their emissions over their lifecycle of several decades by using any new fuels that come into the market.

Improving the energy efficiency of ships already in service and regulating the energy efficiency of new ones yet to be built are key means of reducing greenhouse gas emissions from shipping further at international level. More energy-efficient ships consume less fuel, thus reducing emissions into air. As fuel consumption is a key cost item for shipping companies, much has already been done to improve energy efficiency. The energy

efficiency of new ships has not developed steadily, however, and studies have found significant differences between ship types.[6]

The traditional thinking is that energy efficiency of the global fleet will improve as new ships are designed and built. In the future, building ships with longer and narrower hulls could be part of the solution for improving their energy efficiency. Larger ships will also offer improved energy efficiency. However, this development is strongly linked to the maritime transport market. For example, the ship's length is known to have a significant impact on its building costs, and shorter and wider ships may consequently be preferred, even if this is not the optimal solution in terms of energy efficiency and attaining climate objectives.

From the perspective of reducing shipping emissions, not only ensuring that all ship types of the future generate less emissions but being able to address changes in operating concepts as early as possible in ship design will be essential. Combining freight and passenger transport, for example, has up till now brought efficiency and cost benefits to Finnish charterers and led to the building of ships that serve this concept. This is why passenger ferries play an important role in Finnish break-bulk exports and imports. However, changes in travel behaviour due to the coronavirus pandemic, travel restrictions and other possible exceptional conditions may lead to different concepts for the carriage of sea freight and cruise travel in the future, or other transport concepts that differ significantly from the existing ones. This development and corresponding transformations in the maritime transport market pose a challenge to the design of new low-emission and, ultimately, zero-emission ships.

The Finnish merchant fleet cannot be renewed without major investments made by shipping companies. The central government has the possibility of supporting this renewal by developing guarantee schemes or other funding models. The European Investment Bank already offers maritime guarantee and loan instruments available for large joint projects of operators based in several countries.

Continuing to improve the energy efficiency of Finnish shipping will be vital. As a state that depends on foreign trade carried by sea, Finland must also address the special conditions affecting energy efficiency in the northern Baltic Sea to secure its merchant shipping. Regardless of the quality or amount of icebreaking assistance, sufficient vessel power and ice-strengthening of the ship's hull and propulsion equipment will remain prerequisites for safe winter navigation.

6 Faber & Hoen (2015): *Historical trends in ship design efficiency*

The repayment period of retrofitting that improves existing vessels' energy efficiency is long, and many of the existing vessels will reach the end of their lifecycle in 2045. When planning incentives, attention should thus be paid not only to the design and building of new ships but also to ships and retrofitting that offer the best possible emissions reduction benefits by 2045. Offering such solutions is also a significant opportunity for the Finnish maritime industry.

Measures:

7) Continuing to grant discretionary government transfers for shipbuilding innovations that reduce greenhouse gas emissions from ships.

8) Investigating the possibility of creating a state environmental investment support scheme for ship retrofits and acquisitions of newbuildings that reduce greenhouse gas emissions from ships.

2.3 Improving the management of maritime and inland waterway transport with the aim of reducing emissions

Waterborne transport is a complex system consisting of different stakeholders, activities and infrastructure, both in water and on land. All components of this system have an impact on shipping emissions. Examples of ways in which emissions can be reduced include correct timing of ships' arrival and departure in ports, vessel traffic control, operational management of ships and efficient management of waterways.

The preconditions for more efficient maritime logistics include advanced communication technology, digital services, information sharing and the opening up of information systems. By developing information exchanges related to port calls, ships could time their arrival better, allowing them to slow down at sea and thus reduce their emissions. Similarly, more accurate anticipation of loading times will enable ships to set off with less rush. In particular, waiting for a berth near ports is a global challenge, especially for international shipping, which slows down transport and causes emissions. In liner shipping typical of Finland, it is relatively rare for ships to end up waiting for a berth.

Industry port in wintertime (Photo: Shutterstock)

While ports are important transport nodes, there are major differences between Finnish ports regarding the volume and type of vessel traffic, the customer base and emissions alike. Most Finnish port companies are fully or partly owned by the port cities, however. The cities can reduce emissions by facilitating smooth traffic flows through their ports. Smooth traffic flows can be improved by optimising the placement of functions and traffic arrangements as well as by developing port services that are easier to use and increasingly digital. Cities as port owners should also encourage the ports to systematically develop their operations to reduce emissions, with zero emissions as the ultimate goal.

Agreements on maritime transport are made between the charterer and the shipping company under charter parties or contracts of carriage. A charter party is usually concluded through shipbrokers who represent the shipping company and the charterer, as a rule on contract forms that have been in use for decades. In some charter types, such as time chartering, the charterer is responsible for the ship's commercial operation and travel costs instead of the shipowner. Consequently, the charter party templates underlie many decisions that affect shipping emissions.

Charter parties may make it more difficult for shipping companies and shipmasters to seek emissions reductions by operational means. For example, the clauses of the charter party may result in some vessels being empty on return voyages. The IMO, the EU or the states have little or no possibility of influencing the content of commercial charter parties. The main responsibility for concluding charter parties that support the attainment of emissions reduction targets lies with the charterer, and the largest charterers in Finland could play an important role in reducing greenhouse gas emissions from maritime transport, should they so wish.

The government encourages Finnish charterers to include not only speed or schedule-related targets but also emissions reduction goals in their charter parties. Chartering ships which run fully on non-fossil driving powers should be competitive in short-sea shipping in the Baltic Sea by no later than 2045.

Due to Finland's climate and geographical location, icebreaking is an essential service for maritime transport. All ports on the Finnish coast may freeze in winter. While the assistance needs of winter navigation vary from year to year, they place Finnish shipping in a different position compared to such competitors as other EU countries, even if climate change is factored in. The long-term predictions of the Finnish Meteorological Institute indicate that rather than making ice winters milder, climate change may bring winters that are more variable and difficult to predict. Efficient winter navigation services can mitigate the increase in emissions from merchant shipping.

In addition to improving the efficiency of the winter navigation system, shipping emissions can also be reduced through other measures related to transport infrastructure management. Deepening ports' access channels, for example, will allow larger vessels to enter them, and the same cargo volume can be carried to the port on a single large ship rather than two or more smaller ones, reducing the total emissions per transport performance. Emissions can also be reduced by promoting digitalisation and new types of aids to navigation in waterways. Smart buoys and other aids to navigation can be enhanced with technology that senses shipping emissions. Such solutions could be developed into successful Finnish export products.

Fleet renewal and transition to alternative fuels are equally essential in inland waterways as in maritime transport in order to reduce greenhouse gas emissions. In addition to transport being interrupted for a month or two in winter, the challenges to inland waterway transport include the requirements set by industry and the Saimaa Canal for vessels used for transport, in addition to maintaining a balance between exports and imports. In order to use the full potential of inland waterway transport, long-term transport system planning must address the environmental performance of waterborne transport as well as ensure the effectiveness and adequacy of the port and fairway network and its services, encouraging a modal shift from road transport to low-emission water transport.

Measures:

9) Implementing without delay the proposals of the National Transport System Plan for developing key transport nodes, including ports, as part of sustainable and smooth travel chains, making full use of the possibilities offered by digitalisation.

10) Improving the availability of up-to-date information and smooth deliveries in the maritime and logistics sector to increase efficiency and reduce emissions in keeping with the Logistics Digitalisation Strategy published by the Ministry of Transport and Communications in October 2020.

11) Formulating more detailed policies on automated shipping in the transport automation plan prepared by the Ministry of Transport and Communications, also from the perspective of ecological sustainability.

12) Building a completely new maritime information system for Finland to promote extensive information exchanges in ports as set out in Regulation (EU) 2019/1239 establishing a European Maritime Single Window environment *(EMSW Regulation)*.

13) Developing the modelling and control of winter navigation and designing more energy-efficient and environmentally friendly icebreakers to reduce emissions from winter navigation.

14) Taking the greenhouse gas emissions of a ship, service or fuel to be procured into account in public tenders and framework agreements in connection with environmental impacts. Taking the policies of this Resolution into account in public administration, however ensuring that the Defence Forces, the Border Guard, the Finnish Transport Infrastructure Agency and other authorities will continue to have the freedom to design, procure, charter and operate ships as required by their duties.

15) Installing more smart aids to navigation in merchant shipping lanes, and using as many devices as possible to collect not only traffic information but also data on shipping emissions in keeping with the National Transport System Plan.

16) Launching the development of the Saimaa Canal as outlined in the budget proposal for 2021 in order to promote cost-effective and environmentally friendly transport in Eastern Finland.

17) Investigating the possibility of a modal shift from road to inland waterways transport as part of research in reducing emissions from logistics.

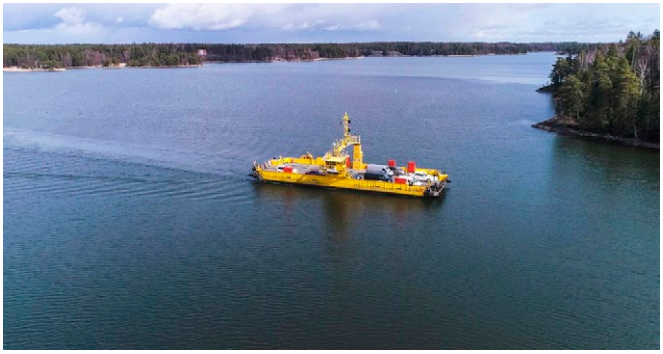
2.4 Reducing greenhouse gas emissions from ferry traffic and boating

Ferries are part of the road network in Finland. Efforts to address environmental impacts are more advanced in road ferry traffic than in archipelago ferry traffic, as the traffic volumes of the former are higher. In road ferry traffic, the funding for basic transport infrastructure maintenance enables the procurement of service contracts of 10 to 15 years in duration, which mitigates the rise in costs and provides opportunities for gradually replacing the fleet. New battery technologies and the use of electricity are some of the key methods of reducing emissions from ferries.

Archipelago ferry traffic is managed and developed pursuant to the Island Development Act (494/1981). Not only this Act but also most of the fleet used for archipelago traffic go back for decades. The contract periods are shorter and the financial possibilities of small service providers to replace their fleet are poorer than in road ferry traffic. Consequently, optimising the transport performance to meet the demand and increasing the use of biofuels are the only short-term means of reducing emissions. The utilisation ratio of the ferries is very low on some archipelago routes.

Waterbus services refer to all coastal and inland waterway services in which several persons are carried against payment and which are not ferry services. In practice, this traffic consists of short cruises or transport to tourist destinations on the coast and in the archipelago. Means of reducing emissions from waterbuses include gradually switching to solutions powered by electricity and biofuels. The challenges of electrification include charging possibilities in the ports used by waterbuses and the weight and size of the required batteries. Portable batteries which could be used for other purposes outside the boating season are a possible line of development.

In 2019, boating generated CO_2 emissions amounting to approx. 122,000 tons in Finland. This accounts for approximately 23% of all emissions from domestic waterborne transport. In boating, replacing old engines will be a key means of reducing emissions by 2030.



A ferry near Raseborg, Finland.
Photo: Shutterstock

Measures:

18) Promoting fleet renewal in ferry traffic by means of longer procurement contracts.

19) Forming archipelago ferry routes into operationally and economically efficient entities, thus enabling the optimisation of the fleet and operating costs and reductions in emissions.

20) In connection with the revision of the EU's Recreational Craft Directive, supporting stricter emission and noise level requirements for recreational craft engines if this can be shown to encourage the uptake of low-carbon and carbon-free propulsion powers in recreational boating.

2.5 Supporting emissions reduction measures based on carbon pricing and other market-based measures in international shipping

A number of methods related to the pricing of emissions or fuels are available to cut the emissions from waterborne transport. Not only are global instruments the most effective, as they cover a larger proportion of the emissions, but they also generally are the most efficient because they do not involve a risk of carbon leakage. The risks of solutions covering large subareas, such as the EU, include market disruptions or avoidance of the area's ports if this is made possible by route or fuel planning.

Marine fuels used in international shipping remain exempted from tax globally. This practice results partly from states being anxious to avoid tax competition and market disruptions in a highly international field, and partly from the limits of national legislation and the difficulty of agreeing on international taxes. In the EU, marine fuels are exempt from energy tax pursuant to Article 14 of the Energy Tax Directive (2003/96/EC). Increasing

criticism has been levelled at the tax exemption for fossil fuels in shipping as negotiations on emissions reductions make headway in the IMO.

In the IMO, international shipping industry lobby groups have proposed levying a mandatory contribution per ton of marine fuel consumed to a research and innovation fund to promote research in low-carbon shipping. Rather than an actual market-based method relying on carbon pricing, this contribution is about collecting capital in an internationally managed fund to develop low-carbon and zero-carbon ships, marine fuels and other technologies. On the basis of this and other proposals, the IMO will initiate a discussion on market-based measures that would provide a stronger incentive than the fund. According to the Initial IMO Strategy on reduction of GHG emissions from ships, these measures will be finalised and agreed between 2023 and 2030.

In principle, global emissions trading would be a better alternative for the international maritime sector than internal emissions trading of the EU. However, a prerequisite for global emissions trading would be consensus between the 170 IMO Member States; reaching this consensus would take time and require a much more ambitious approach from a number of states to build systems that would be in line with both IMO objectives and the goals of the Paris Agreement. It is thus likely that decisions on emissions trading

Icbreaker Otso assisting a merchant vessel in the Bothnian Bay. Photo: Flying Focus and Arctia Ltd.

within the EU will be made before 2023 according to plans outlined by the Commission. This year would only mark the initiation of the process of making decisions on a global ETS and other market-based measures in the IMO. This is why Finland finds it important that, when making decisions on emissions trading in the EU, its fitness for future global application and the possible impact of regional regulation on the progress of the IMO's negotiations should be assessed. Attention should also be paid to any negative effects on trade relations.

The general prerequisites for effective and fair regional regulation are flag neutrality (equal treatment of ships irrespective of their flag state), and equal treatment of ships calling at ports both inside and outside the region. Equal treatment of ships and shipowners of different sizes will also promote a level playing field. Regional regulation should genuinely reduce emissions, without leakage to other sectors, modes of transport or outside the regulated area. The regulation should avoid creating new barriers to trade and be as simple as possible.

The impacts of potential emissions trading in shipping will crucially depend on its implementation methods. Key choices include the geographical coverage of the ETS and whether it is separate from or integrated with EU ETS. Shipping cannot be included in the EU ETS without a comprehensive impact assessment which would take into account the diversity of shipping and its different conditions around Europe. In its efforts to exert influence on this matter, Finland has highlighted the importance of including an estimate of the system's emissions reduction potential with different implementation options in the impact assessment. The points Finland finds essential when assessing different options for ETS implementation are the actual impact of the ETS for shipping on reducing emissions, impacts on Finland's foreign trade and maritime transport in the Baltic Sea, which is essential to Finland, as well as the system's impact as part of the full set of emissions reduction methods.

The special requirements of winter navigation and the additional costs already incurred from it by vessels calling at Finnish ports should be taken into account when designing the possible emissions trading system. The geographical coverage of emissions trading plays a role in its climate impacts as well as in its impacts on costs and competitiveness in different business sectors. Broader coverage could possibly even out the impacts on competitiveness between Member States. In addition, the ETS should encourage the deployment of new technologies.

Economic incentives for reducing shipping emissions in the Baltic Sea region were examined in a report published by the Finnish Transport and Communications Agency Traficom in May 2020.[7] This report provided for the first time an overview of national incentive practices in different Baltic Sea states. The report indicates that national and EU subsidies as well as public loans and guarantees, in particular, have facilitated shipowners' investments in environmentally friendly technologies. In addition to these measures, tax relief and reduced fees granted on environmental grounds were found to be effective economic incentives with certain reservations.

In Finland, such relief forms are assessed separately when developing fairway, pilotage and port fees. In other countries and ports, various indexes and assessment methods of ships' environmental performance have been used as the basis of discounted fees, including the *Environmental Shipping Index* (ESI), *Environmental Port Index* (EPI) and *RightShip GHG Rating*. These system can also help charterers and financial institutions assess the environmental footprint of different ships and shipowners.

The same voluntary maritime environmental management certificates and emission assessment methods should be used, at least within such subareas as the EU, to ensure a fair comparison of ships. Under the current EU regulation on the monitoring, reporting and verification of CO_2 emissions from shipping (the so-called MRV Regulation) emissions can be allocated to passengers and freight in different ways. A single allocation method should be used in the EU to facilitate the comparison of emissions from ships. The emissions reduction method being developed in the IMO, which sets limits on the carbon intensity of ships, could also provide new possibilities for comparing the environmental performance of ships, should the monitoring of carbon intensity of ships be made mandatory.

Measures:

21) Supporting the development of market-based emissions reduction measures, which guide operators to use low-carbon and non-carbon fuels, in the IMO. Taking into account the framework of national laws and EU tax legislation as well as the common position of other EU Member States and the Commission when formulating Finland's position.

22) Any funds raised through global market-based emissions reduction measures should be spent on the rapid development and deployment of solutions that reduce emissions from ships. In fund allocation, particular attention should

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be paid to the least developed countries and small island developing states. If the emissions reduction measures include an international fund, it should be established by an international treaty, and the collection and allocation of funds should be under separate management.

23) If the amount of greenhouse gas emissions from international maritime transport cannot be significantly reduced in line with the objectives of the IMO's GHG Strategy, Finland is in favour of dropping the tax exemption for merchant shipping fuels and introducing a global tax or levy on fossil fuels.

24) In any EU-wide emissions trading in shipping, Finland will exert influence for factoring in the effectiveness of the system in reducing emissions, the risk of carbon leakage, impacts on foreign trade and competitiveness as well as the special conditions of winter navigation. The fact that the industry must contribute to attaining the EU 's climate objectives should also be taken into account. In addition to the Commission's impact assessment, the national work to investigate the impacts that emissions trading would have on Finland's foreign trade and competitiveness will be continued.

2.6 Exerting active influence for reducing shipping emissions in international cooperation

Finland will promote the reduction of emissions from waterborne transport in the IMO and the EU as well as at regional level in the Baltic Sea Protection Commission Helcom, in addition to Nordic and bilateral cooperation with its closest maritime neighbours. The key objective of exerting influence at all levels of cooperation is developing and implementing effective emissions reduction measures as soon as possible in line with the Initial IMO Strategy on reduction of GHG emissions from ships and the temperature goals of the Paris Agreement.

Ships flying the Finnish flag, Finnish shipping companies and the entire Finnish maritime cluster should set an example on the pathway to the IMO's emissions reduction targets. The Finnish maritime cluster is committed to these targets and already finds itself at the forefront of developing several emission reducing technologies, including new types of marine engines and rotor sails. However, international decisions must be made to speed up the change in order to achieve the objectives. This will also create new business opportunities for Finland.

A merchant vessel in icy waters near Kemi, Finland.
Photo: Leonard Zhukovsky / Shutterstock, editorial use only.

European Union legislation covers greenhouse gas emissions from shipping, for example under the Regulation on the monitoring, reporting and verification of carbon dioxide emissions from maritime transport (MRV Regulation, 2015/757). As described above, however, the Commission is proposing to extend the EU ETS to maritime transport and suggesting ways in which demand for alternative marine fuels could be promoted. In addition, the Union and its Member States are actively involved in IMO negotiations on international measures to reduce emissions from ships. The positions on matters falling within the exclusive competences of the Union will be set out in a Council decision. The Union's positions on matters falling within shared competence will also be coordinated by the Council's *Working Party on Shipping*.

The Nordic countries are pioneers in the development of low-emission marine technology. Additionally, the sea areas around the Nordic countries are particularly sensitive and vulnerable. The growth in tourism directed to the Baltic Sea, the North Sea and the Norwegian Sea increases the need to strengthen Nordic cooperation on the seas. Consequently, all Nordic countries are striving to reduce emissions from maritime transport and are often among the countries urging for the most ambitious emissions reduction measures, both in the IMO and the EU. Together with Sweden, Denmark and the Baltic countries, Finland will bring the perspectives of the Baltic Sea, short-sea shipping and winter navigation to bear on EU discussions on emissions reductions measures in maritime transport. The Nordic Council of Ministers has also for long supported the protection of northern sea areas and funded several maritime projects in which Finland has participated. In addition to official Nordic cooperation structures, close dialogue is also conducted directly between national transport administrations.

Measures:

25) Finland will support measures through which IMO emissions reduction targets for international shipping can be attained on schedule, minimising any market disruptions. Finland will prioritise solutions that enable the attainment of ambitious targets for reducing emissions from shipping while allowing shipping companies and operators to choose their preferred emissions reduction methods. Finland will pay particular attention to ensuring that the challenges and special features of winter navigation and scheduled short-sea shipping in the Baltic Sea will be addressed when selecting emissions reduction methods for international shipping.

26) In the light of the results of the Fourth IMO GHG Study and in order to achieve the temperature goals of the Paris Agreement, Finland will support more stringent emissions reduction targets for the Initial IMO Strategy on reduction of GHG emissions from ships while addressing the special features of winter navigation and short-sea shipping in the Baltic Sea.

27) Finland will actively promote the deployment of renewable fuels in the IMO through internationally binding decisions as part of mid- and long-term emissions reduction measures.

28) Finland will actively exert influence for reaching an agreement on the principles of alternative fuel lifecycle analyses in the EU and the IMO to promote the deployment of sustainable alternative fuels.

29) Finland is striving for a leading position as a developer of automation and digitalisation solutions for shipping, particularly those that produce emissions reductions, including the sharing of timetable data and route optimisation.

30) In the Baltic region and Nordic cooperation, Finland will actively participate in projects aimed at reducing shipping emissions and developing the distribution infrastructure for new fuels for merchant shipping.

3 Monitoring and indicators

The measures will mainly be implemented within the limits of the Budget and the existing appropriations. Decisions on additional appropriations or other measures affecting the Budget will be made separately within the central government spending limits and in the annual budgets.

Progress made in implementing the Resolution will be monitored biannually by the Ministerial Working Group on Climate and Energy Policy and, at regular intervals, in the steering group for maritime policy appointed by the Prime Minister's Office and in the Ministry of Transport and Communications. The links between these measures and other projects will be established during the implementation phase.

As indicators of the effectiveness and impacts of measures aiming to reduce greenhouse gas emissions from maritime and inland waterway transport will be used the emission figures produced by the MEERI calculation system, the results of the MERIMA model concerning greenhouse gas emissions from maritime transport in Finland's foreign trade, and the Finnish Meteorological Institute's annual calculations of emissions from vessel traffic in the Baltic Sea. The indicators will be developed in cooperation between VTT Technical Research Centre of Finland, the Finnish Meteorological Institute and the transport and communications administration.

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